

PATENT CLAIMS

1. An illumination unit for point illumination of a medium comprising a plurality of light emitters in the form
5 of light guides arranged to illuminate an illumination face via a light valve arrangement, said light valve arrangement comprising a plurality of electrically controlled light valves, c h a r a c t e r i z e d in that at least one of the light emitters (3) is arranged to
10 illuminate a plurality (4) of light valves (6).

2. An illumination unit according to claim 1, c h a r a c t e r i z e d in that it additionally comprises a first lens arrangement, said lens arrangement comprising
15 at least one micro lens arranged with respect to each light valve so that the light emitted by the light emitter or emitters is focused on or in the vicinity of the optical axis of the individual light valves.

20 3. An illumination unit according to claim 1 or 2, c h a r a c t e r i z e d in that it additionally comprises a second micro lens arrangement arranged between the light valves and the illumination face, so that light transmitted through the light channel of the individual
25 light valve is suitably focused on the illumination face (5).

4. An illumination unit according to claims 1-3, c h a r a c t e r i z e d in that the optical light
30 guide or guides (3) are formed by optical fibres, preferably multimode fibres.

5. An illumination unit according to claims 1-4, c h a r a c t e r i z e d in that at least one of the
35 light sources (1) is formed by a short arc gap lamp.

6. An illumination unit according to claims 1-5,
c h a r a c t e r i z e d in that the light source comprises a short arc gap lamp (1) having light receiving optical light guides or fibres (3) which are arranged
5 within an angle of $\pm 75^\circ$ with respect to the equator axis (E) of the lamp on a ball face around the lamp, and which are optically connected to and conduct light to the light emitters.
- 10 7. An illumination unit according to claims 1-6,
c h a r a c t e r i z e d in that at least one of the light sources is formed by a laser source.
- 15 8. An illumination unit according to claims 1-7,
c h a r a c t e r i z e d in that it comprises a plurality of light emitters (3) in the form of light guides, each of which is optically connected to a light source (1) arranged to illuminate a plurality of light valves (6) arranged in a given face shape, at least one collima-
20 tion lens being arranged between the light emitter and the face shape so that collimated light is conducted to a first micro lens arrangement associated with the plurality of light valves.
- 25 9. An illumination unit according to claim 8, c h a r -
a c t e r i z e d in that the face shape of the light valves forms a hexagon.
- 30 10. An illumination unit according to claim 8 or 9,
c h a r a c t e r i z e d in that the individual light valves are arranged in rows in the transverse direction (9) of the face shape with the light valves at a given mutual distance, and the rows being mutually offset in the transverse direction.
- 35 11. An illumination unit according to claims 8-10,

c h a r a c t e r i z e d in that the rows are arranged such that the projection of all the individual light valves in the transverse direction (T) in the face shape results in a plurality of illumination points at a mutual distance ΔL in the transverse direction (9).

12. An illumination unit according to claims 1-11, c h a r a c t e r i z e d in that the face shape or shapes of the light valves are arranged on one or more illumination heads, each illumination head and the illumination face being adapted to perform a relative movement across an illumination area, said device being also provided with a control unit for controlling the light valves in dependence on the relative movement between the illumination head and the illumination face.

13. An illumination unit according to claims 1-12, c h a r a c t e r i z e d in that the illumination head is constituted by a rod whose relative movement with the illumination face is a single progressing movement in the transverse direction of the rod.

14. An illumination unit according to claims 1-13, c h a r a c t e r i z e d in that the illumination unit between the light valve arrangement and the illumination face additionally comprises optical means for spreading the light beams emitted by the light channels across the illumination face.

15. An illumination unit according to claims 1-14, c h a r a c t e r i z e d in that the light valves of the illumination unit are formed by electrooptically based light valves (spatial light modulators), such as LCD, PDLC, PLZT, FELCD or Kerr cells.

16. An illumination unit according to claims 1-15,

c h a r a c t e r i z e d in that the light valves of the illumination unit are formed by reflection based electromechanical light valves, such as DMD.

5 17. An illumination unit according to claims 1-16, c h a r a c t e r i z e d in that the light valves of the illumination unit are formed by transmission based electromechanical light valves.

10 18. An illumination unit according to claims 1-17, c h a r a c t e r i z e d in that the light guides of the illumination unit are so arranged with respect to the light valve arrangement that the optical energy fed to each subset of light valves does not differ significantly
15 from each other when the subsets of light valves illuminate adjacent areas or areas close to each other on the illumination face.

19. An illumination unit according to claims 1-5 and
20 claims 7-17, c h a r a c t e r i z e d in that the light receiving ends of the light guides are gathered in at least one bundle which directly or indirectly receives light from a reflector or a reflector system optically connected to at least one lamp.

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